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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/589,733	03/22/2007	Masashi Nakamura	1592-0163PUS1	2225

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EXAMINER

SINGAL, ANKUSH K

ART UNIT	PAPER NUMBER
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2895

NOTIFICATION DATE	DELIVERY MODE
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11/27/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No. 10/589,733	Applicant(s) NAKAMURA ET AL.	
	Examiner ANKUSH k. SINGAL	Art Unit 2895	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 July 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>07/13/2009</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 1-5 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davis et al.(US 6,257,760) in view of Yoon et al.(US 2003/0077870)

Re. claim 1, Davis et al. teaches a process flow diagram in which a plurality of substantially similar superlattice structures are first formed by depositing alternating layers of distinctly different sub lattices upon silicon-based substrates. Thereafter, a resistivity versus temperature calibration curve is formed for the superlattice structures. To obtain the data required for the calibration curve, each of the superlattice structures is annealed in a furnace or a RTA unit at a different temperature for a pre-defined period of time. The range of anneal temperatures may vary, depending upon the temperature range of the fabrication process whose temperature is to be determined in subsequent steps. After a superlattice structure is annealed, it is desirable to allow the structure to cool down to at least room temperature. In this manner, interdiffusion of atoms between the sublattices of the superlattice structure is terminated. As such, the atoms within the superlattice structure are "frozen" at the positions they migrated to during the anneal process. The resistivity of each of the superlattice structures may then be measured in order to create the calibration curve(Figure 3, Abstract and Column 6,lines 56-67 and Column 7,lines 1-9)(same as measuring a resistivity of arbitrary semiconductor substrates at a room temperature; obtaining respectively a relation between a heating temperature and a temperature of a surface of the arbitrary semiconductor substrates ,

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for the arbitrary semiconductor substrates having different resistivities; setting and adjusting said heating temperature of a semiconductor substrate to be used based (i) a measured resistivity of the semiconductor substrate to be used and (ii) the obtained relationship between the heating temperature and the temperature of the surface of said semiconductor substrate)(The silicon substrate and similar superlattice structures are considered to be the semiconductor substrates) and then another superlattice structure (same as epitaxial layer) is grown, wherein the temperature of said surface of said semiconductor substrate to be used is indirectly controlled by adjusting said heating temperature(Column 7, lines 11-16) but does not teach a vapor phase growth method for growing an epitaxial layer on a substrate.

However, Yoon et al. teaches a vapor phase method for growing an epitaxial layer on a substrate(Para[0016]) to control the growth of the layer in real time.

Therefore it would have been obvious for one with ordinary skill in the art at the time the invention was made to provide Davis et al. structure with a vapor phase growth method for growing an epitaxial layer on a substrate of Yoon et al. to control the growth of the layer in real time.

Re. claim 2 as discussed above in claim 1, Davis et al. and Yoon et al. in combination disclose all the limitations as discussed above in claim 1 including wherein the

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semiconductor substrate is a compound semiconductor(i.e. Fe-doped InP substrate)(Para[0016], Yoon et al.).

Re. claim 3 as discussed above in claim 2, Davis et al. and Yoon et al. in combination disclose all the limitations as discussed above in claim 2 including wherein the semiconductor substrate is an InP substrate(Para[0016], Yoon et al.).

Re. claim 4 as discussed above in claim 3, Davis et al. and Yoon et al. in combination disclose all the limitations as discussed above in claim 3 including wherein the semiconductor substrate is an Fe-doped In P substrate(Para[0016], Yoon et al.).

Re. claim 5 as discussed above in claims 1 to 4 , Davis et al. and Yoon et al. in combination disclose all the limitations as discussed above in claims 1 to 4 including wherein a molecular beam epitaxy is used to grow an epitaxial layer(Para[0016], Yoon et al.).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANKUSH K. SINGAL whose telephone number is (571)270-1204. The examiner can normally be reached on Monday-Friday 7am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Richards can be reached on (571)272-1736. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Fernando L. Toledo/
Primary Examiner, Art Unit 2895

/A. k. S./
Examiner, Art Unit 2895